LIBRARY
STATE PLANT BOARD

TECHNICAL SERIES, No. 12, PART IX.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF ENTOMOLOGY.
L. O. HOWARD, Entomologist and Chief of Bureau.

MISCELLANEOUS PAPERS.

A NEW GENUS OF ALEYRODIDÆ,

WITH REMARKS ON ALEYRODES NUBIFERA BERGER, AND ALEYRODES CITRI RILEY AND HOWARD.

By A. L. QUAINTANCE,
In Charge of Deciduous Fruit Insect Investigations.

ISSUED SEPTEMBER 1, 1909.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1909.

SB
823
A25

CONTENTS.

	Page.
Paraleyrodes, new genus	169
Paraleyrodes (*Aleurodicus*) *persex* Quaintance	170
Remarks on *Aleyrodes nubifera* Berger and *Aleyrodes citri* Riley and Howard	173

ILLUSTRATIONS.

		Page.
FIG. 35.	*Paraleyrodes persex:* Pupa on leaf, pupa-case and details	171
36.	*Paraleyrodes persex:* Antenna, right fore wing male genitalia, and claw of third leg of adult	172

U. S. D. A., B. E. Tech. Ser. 12, Pt. IX. Issued September 1, 1909.

MISCELLANEOUS PAPERS.

A NEW GENUS OF ALEYRODIDÆ, WITH REMARKS ON ALEYRODES NUBIFERA BERGER, AND ALEYRODES CITRI RILEY AND HOWARD.

By A. L. Quaintance,
In Charge of Deciduous Fruit Insect Investigations.

In 1900 the writer described[a] as *Aleyrodes perseæ* a species of white fly found in the Bureau of Entomology collection, received from Fort George, Fla., and collected April 22, 1880, on *Persea carolinensis*. The adult of this species was at the time unknown. The so-called pupa-case, however, exhibited the essential structural characters of this stage for the genus *Aleurodicus*, and it was ventured in the description that the adult when found would show the insect to belong to this genus. Professor Cockerell,[b] for the reasons given, referred this species to *Aleurodicus*, and this assignment seemed to the writer well warranted.

Dr. A. W. Morrill, in the course of his orange white-fly investigations in Florida during the past two or three years, has frequently met with this insect on orange and other plants and has been able to obtain the adult in quantity. He has kindly furnished the writer with abundant specimens of all stages and copies of his notes. The adult, contrary to what had been expected from the structure of the pupa-case, is not an *Aleurodicus*, and presents certain peculiarities not found in other genera of the family, thus necessitating the establishment of a new genus, as follows:

PARALEYRODES, new genus.

With wing venation of Aleyrodes. Pupa-case of Aleurodicus type. Fore wings with but a single vein, and a rudimentary branch near basal fifth. Hind wings with a single unbranched vein. Antennæ four-jointed, apparently due to coalescence into two segments

[a] Tech. Ser. 8, Div. Ent., U. S. Dept. Agr., p. 32.

[b] Catalogue of the Aleyrodidæ of the World (Proceedings Academy Natural Sciences, Philadelphia, 1902, p. 279).

of joints 3 to 7. Pupa-case with the compound wax pores and large protruding lingula of *Aleurodicus*.

Type, the following species:

Paraleyrodes (Aleurodicus) perseæ Quaintance.

REVISED DESCRIPTION.[a]

Egg.—Elliptical, size about 0.24 mm. by 0.12 mm., with stalk unusually long; smoky in color, the shell smooth; eggs deposited promiscuously in the white, flocculent secretion of the adults.

Larva, first stage.—Size about 0.338 mm. by 0.18 mm., subelliptical, very slightly narrowed caudad; yellowish white, with more or less rectangular spots of orange in the abdominal regions, eye spots reddish. There is a fringe all around of white wax; on the margin, cephalad of eyes, are six setæ, and on lateral margins of thoracic region are three on each side. On caudal margin are six setæ, the middle pair of which is considerably longer than others. On ventral surface, just within margin, all around, is a series of sparsely set, small, tubercled setæ. Legs and antennæ well developed. Vasiform orifice practically as in pupa-case.

Pupa-case.[b]—Size about 0.86 mm. by 0.53 mm. (figs. 35, *a* and *b*). Subelliptical in shape, with slightly undulate outline. Color, under hand lens, yellowish brown; empty pupa-case colorless, very fragile, soon falling from the leaf. On the margin, all around, is a fringe of more or less curled, short, white wax ribbons, and over the case and adjacent leaf area are many fragments of white wax rods, of variable length, profusely produced from the seven pairs of dorsal compound pores, which are situated, a pair on cephalic end and six pairs on the abdominal segments, the cephalic two pairs of which are smaller and nearer the median line. The margin, or rim, of each compound pore

[a] Extended and corrected from Tech. Ser. 8, Div. Ent., U. S. Dept. Agr. (1890), p. 32.

[b] In the description of the waxy secretion, as originally given (l. c.), this was described as follows:

"There is a profuse dorsal exudation: First, a rather short, downward-curving fringe of pearly white wax, all around, arising from just within margin and curling outward and downward over margin to near surface of leaf. This fringe is hardly continuous but is more or less split apart into ribbons or bands. Second, more dorsally curving columns. These occur in a triangle, one on each side and one at end. These columns of white wax are about as high as pupa case is wide. The pupa-case is almost obscured by this exudation, when viewed from above."

According to Doctor Morrill's observations the secretion, as above described, is abnormal to this species and is due to the effect of parasitism. Of many specimens examined by him, showing the secretion of this character, all were found to be parasitized; and, on the other hand, this type of secretion was never found on pupa-cases not attacked by parasites. The normal secretion therefore is as described in the text.

(fig. 35, *a*) is thickened, and from within the cup there arises a rather large, fluted, cylindrical tube, extending upward about one-half its length beyond the rim of cup. Within tube, at base, is a short conical

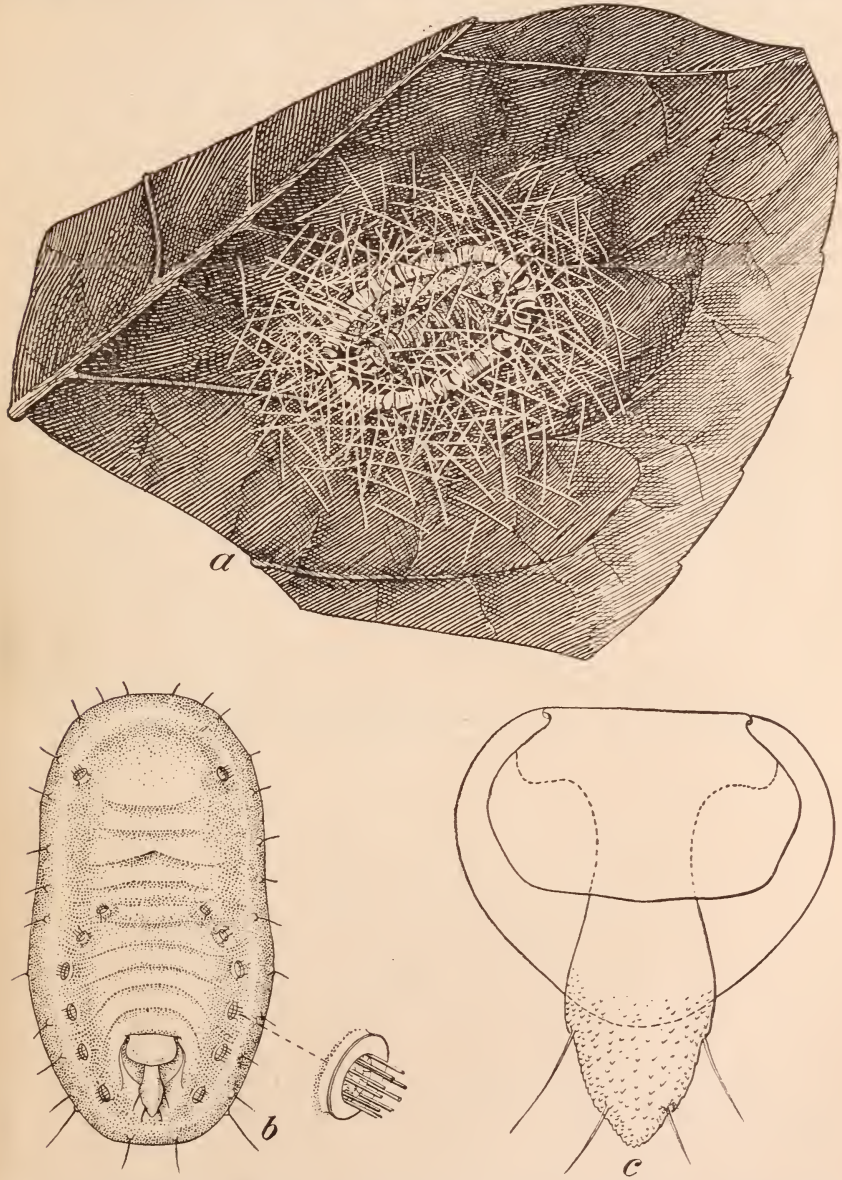

FIG. 35.—*Paraleyrodes perseæ: a,* Pupa on leaf, showing fragments of wax rods from dorsal compound pores, enlarged; *b,* pupa-case, much enlarged, with highly magnified compound pore at right; *c,* vasiform orifice, operculum, and lingula of pupa-case, highly magnified. (Original.)

elevation. The entire structure is brownish in color. Dorsum void of well-developed setæ, save a pair just within caudal margin. A pair of minute setæ occurs on margin near caudal end of case. There is,

however, just within margin on case, all around, a row of brownish-colored, tubercled setæ. Vasiform orifice subcordate (fig. 35, *c*), about as long as wide. Cephalic margin straight, coinciding with cephalic margin of operculum. Operculum subrectangular, the lateral margins somewhat rounded; considerably wider than long and with caudal margin almost straight. Lingula relatively large, particularly distally, where it becomes broadly spatulate; longer than orifice, and bearing distally two pairs of setæ. Abdominal segments moderately distinct. Rudimentary feet and antennæ very evident.

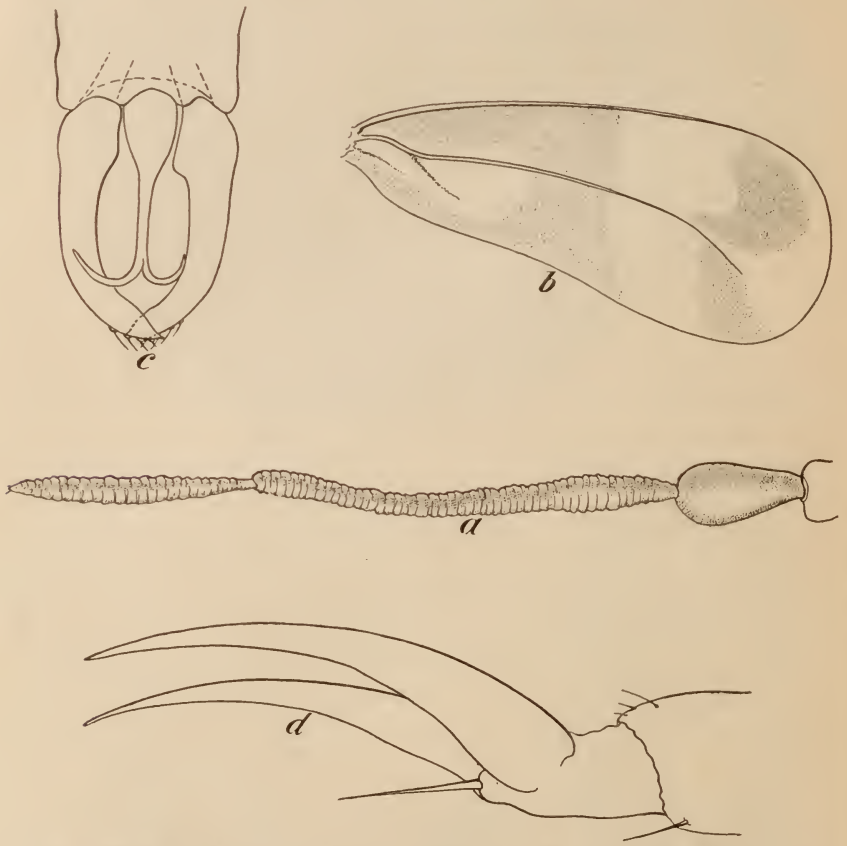

FIG. 36.—*Paraleyrodes perseæ: a,* Antenna of adult; *b,* right fore wing of adult; *c,* male genitalia; *d,* claw of third leg of adult. Highly magnified. (Original.)

Adult.—Body of living specimens buff or pinkish in color, marked with white. Wings whitish, but clouded with dusky. These are held almost flat along the dorsum, and do not meet along the middle line. A copious amount of flocculent white wax is secreted, which becomes scattered over the leaf surface, the sluggish adults resting in little depressions here and there in the waxy covering. Antennæ peculiar and apparently of but four joints (fig. 36, *a*), due to the evident

coalescence into two joints of the ringed segments 3 to 7. In the fore wing there is a single vein, as in *Aleyrodes* (fig. 36, *b*), with a rudimentary branch or fold near basal fifth and a very obscure rudimentary vein at very base of wing. Hind wings with but a single vein. Genitalia in male forcipate, penis bifurcate (fig. 36, *c*). Claws long and slender, with central spinous process (fig. 36, *d*). In female, length of body, 0.8 to 0.9 mm.; length of fore wing, 0.8 to 0.9 mm.; width of fore wing, 0.3 to 0.38 mm.; length of antenna, 0.38 to 0.45 mm.; length of hind tibia, 0.25 to 0.3 mm. Male proportionately smaller.

Food plants.—Orange, *Persea carolinensis*, persimmon (?), avocado pear. On orange this insect infests the older leaves, rarely or never occurring on the new growth as is the case with *Aleyrodes citri*.

Doctor Howard has given to the parasite of this species, reared by Doctor Morrill, the manuscript name *Encarsia variegatus*.

Remarks on ALEYRODES NUBIFERA Berger, and ALEYRODES CITRI Riley and Howard.

The recent interesting discovery by Dr. E. W. Berger, entomologist of the Florida Agricultural Experiment Station, that the so-called orange white fly (*Aleyrodes citri*) of Florida represents two distinct though closely related species, led the writer to go carefully over the material in the Bureau of Entomology collection in order to determine to what extent the new species *Aleyrodes nubifera* Berger might possibly be found. The results have been interesting, and, as showing the distribution of the new species, are worth recording. Specimens of *nubifera* are in the collection from the following localities:

Pass Christian, Miss., August 23, 1889, on orange.
Raleigh, N. C., September 25, 1889, on orange.
Raleigh, N. C., October 7, 1889, on orange.
New Orleans, La., March 10, 1890, on orange.
Baton Rouge, La., February 23, 1895, on orange.
Crescent City, Fla., January, 1895, on gardenia.
Crescent City, Fla., January 30, 1895, host not indicated.
Crescent City, Fla., February 24, 1895, on orange.
Crescent City, Fla., March 1, 1895, on orange.
Santiago de las Vegas, Cuba, March 7, 1905, on orange.
Santiago de las Vegas, Cuba, May 6, 1905, on orange and other citrus fruits.
Santiago de las Vegas, Cuba, June 6, 1905, on tangerine orange.
Waco, Fla., October 21, 1908, on orange.
Florida (locality not given), November 23, 1908, on orange.
Florida (locality not given), January 18, 1909, on orange.

As will be noted, specimens of this species have been received at different times since 1889. The material from Crescent City, Fla., was collected by Prof. H. G. Hubbard, and labeled by him as *citri*. In fact, all of the Hubbard specimens in the Bureau collection are *nubifera*, and it thus seems possible that Mr. Hubbard did not see the true *Aleyrodes citri* at all.

The material from Cuba, collected by Mr. C. L. Marlatt, and also sent in by Dr. Mel T. Cook, and provisionally referred by the writer to *citri*, belongs, in fact, to *nubifera*, and our record of *citri* for Cuba is incorrect. So far as we are aware, the insect does not occur on the island at all. As to the origin of *nubifera* and the time of its introduction, if from abroad, we have no information. Its affinities are with Oriental species, and it is not improbable that it was introduced into Florida along with or about the time of the introduction of *citri*.

Recently additional information has been obtained relative to the occurrence of *Aleyrodes citri* in eastern Asia. The writer, at a meeting of the Washington Entomological Society, October 4, 1908, exhibited a specimen of *Aleyrodes citri* from Canton, China, on orange, which had been found in the Bureau collection, without other data. In June, 1908, specimens of lemon leaves from Peking, China, infested with an aleyrodid were received by the Bureau from Mr. F. N. Meyer. Eggs, pupa, and one adult were present, and with this series of stages it was possible to definitely determine the insect as *citri*. In July of the same year leaves of Gardenia from Japan, also infested with *Aleyrodes citri*, were received through Mr. E. M. Ehrhorn, and somewhat later, in 1908, six lots of material, all infested with *Aleyrodes citri*, were received through Mr. E. H. Carnes, four of the sendings being from Nagasaki, Japan, and two from Shanghai, China. Four lots were on orange, one on a citrus plant, and one on an unnamed plant—possibly a Viburnum. The material from Nagasaki had been collected in 1903; the balance in 1908.

In Maskell's collection of Aleyrodidæ, recently secured with his coccid collection by Doctor Howard from the New Zealand Institute, was found what is evidently the type slide of Maskell's *Aleyrodes aurantii*, originally described in the New Zealand Transactions (1896), page 431, as a variety of *eugeniæ*. Careful comparison of this insect with *Aleyrodes citri* proves it to be the same species, and Maskell's name hence becomes a synonym of *citri* Riley and Howard. Maskell's material was from the northwestern Himalayas in India, on *Citrus aurantium*. The great similarity of *eugeniæ* to *citri* was noted by Mr. Maskell, but he attributed undue importance to the presence of the three radiating patches, which, while occurring in *citri*, were not mentioned in the description by Riley and Howard.

O

UNIVERSITY OF FLORIDA
3 1262 09229 6382